# THE BOMBAY LIFTS ACT, 1939 (BOM. X OF 1939).

**G. N., P. W. D., No. 8225/27-II, dated 8th April 1940 (B. G., Pt. IV-B, p. 443).** S. 2 (2)

In exercise of the powers conferred by sub-section (*2*) of section 2 of the Bombay Lifts Act, 1939 (Bom X of 1939), the Government of Bombay is pleased to direct that the said Act shall come into force on the first day of June 1940.

**G. N., P. W. D., No. 8225/27-III, dated 8th April 1940 (B. G., Pt. IV-B, p. 443).** S. 3 (a)

In exercise of the powers conferred by clause (*a*) of section 3 of the Bombay Lifts Act, 1939 (Bom. X of 1939), the Government of Bombay is pleased to appoint the Electric Inspector, Bombay State, to be the Inspector of Lifts.

**G. N., P. W. D., No. 8225/27-IV, dated 8th April 1940 (B. G., Pt. IV-B, p. 443).** SS. 4, 5 (1) & (3), 6 (2), 8 (1), 9 (1) and 11.

The Government of Bombay is pleased to authorise the Inspector of Lifts for the purposes of section 4, sub-sections (*1*) and (3) of section 5, sub-section (*2*) of section 6 read with sub-section (*3*) of section 5, sub-section (*1*) of section 8, sub-section (*1*) of section 9 and section 11 of the Bombay Lifts Act, 1939 (Bom. X of 1939).

**G. N., P. W. D., No. 8225/27, dated 6th September 1940 (B. G., Pt. IV-B, p. 905).** SS. 8 (1) & 11

The Government of Bombay is pleased to authorise the Deputy Engineer for the Inspection of Lifts in the Electrical Circle for the purposes of sub-section (*1*) of section 8 and section 11 of the Bombay Lifts Act, 1939 (Bom. X of 1939).

**G. N., P. W. D., No. 8225/27-V, dated 8th April 1940 (B. G., Pt. IV-B, p. 443).** S. 10

In exercise of the powers conferred by section 10 of the Bombay Lifts Act, 1939 (Bom. X of 1939), the Government of Bombay is pleased to delegate the powers conferred on it under sub-section (*10*) of section 4, sub-section (*3*) of section 5, sub-section (*2*) of section 6 read with sub-section (*3*) of section 5, and sub-section (*2*) of section 8 of the said Act to the Electrical Engineer to Government, Bombay.

**G. N., P. W. D., No. 8225/27-VI, dated 8th April 1940 (B. G., Pt. IV-B, p. 444).** S. 12 Bombay Lifts Rules, 1940.

*Amended by G. N., P. W. D., No. 4525/36, dated 14th June 1940.*

In exercise of the powers conferred by section 12 of the Bombay Lifts Act, 1939 (Bom. X of 1939), the Government of Bombay is pleased to make the following rules to carry out the purposes of the said Act, namely :—

1. *Short title.*—These rules may be called the Bombay Lifts Rules, 1940.

2. *Definitions.*—In these rules,

(1) " Act " means the Bombay Lifts Act, 1939.

(2) " Form " means a form appended to these rules.

(3) " Schedule " means the Schedule annexed to these rules.

3. *Permission to erect a lift.*—(1) Every owner of a place intending to install a lift in such place shall make an application in Form A to the Inspector of Lifts.

(2) On receipt of such application the Inspector of Lifts shall, after making such inquiry and requiring the applicant to furnish such information as he may deem necessary, forward the application with his remarks to the Electrical Engineer to Government, Bombay, who may thereupon either grant or refuse the permission.

4. *License to use a lift.*—(1) Every owner of a place who is permitted to install a lift shall within one month after the completion of the erection of such lift deliver or send or cause to be delivered or sent to the Inspector of Lifts notice in writing of such completion and shall make an application to him for a license for working the lift. The notice and the application shall be in Form B.

(2) On receipt of such application, the Inspector of Lifts shall, after making such inquiry as he may deem necessary, forward the application with his remarks to the Electrical Engineer to Government, Bombay, who may thereupon either grant or refuse the license. The license shall be in Form C.

5. *License for existing lifts.*—(1) Every owner of a place in which a lift has been installed before the date of the coming into force of the Act, shall within two months from such date apply to the Inspector of Lifts for a license for the working of such lift. The application for the license shall be made in Form D.

(2) The provisions of sub-rule (2) of rule 4 shall, so far as may be, apply to such application.

6. *License for working of lifts not to be granted unless requirements laid down in Schedule are complied with.*—No license for the working of any lift shall be granted unless the requirements laid down in the Schedule have been complied with in respect of such lift and its installation :

Provided that in the case of a lift installed before the commencement of the Act, a license for its working may be granted notwithstanding the fact that all the aforesaid requirements have not been complied with in respect of such lift and its installation, if the Electrical Engineer, Bombay, is satisfied that no accident resulting in any injury to any person is likely to occur in the operation of such lift. In such case a note of the requirements which are not complied with shall be made in the license.

7. *Terms on which lifts are to be worked.*—Every lift shall be worked subject to the following terms :—

(1) The lift and its installation shall be maintained so that the requirements laid down in the Schedule are always complied with :

Provided that in the case of a lift installed before the commencement of the Act the requirements, a note of which is made on the license under Rule 6, may not be complied with.

(2) The Lift Operators shall be not less than 18 years of age and shall be persons who have been trained in the correct operation of the lifts.

8. *Right to enter any building and order for repairs to lifts in an unsafe condition.*—The notice to be given under sub-section (*1*) of section 8 of the Act shall be in Form E and the order to be issued under sub-section (*2*) of section 8 of the Act shall be in Form F.

9. *Report of accidents.*—Notice of any accident occurring in the operation of any lift resulting in injury to any person required to be given under sub-section (*1*) of section 9 of the Act shall be in Form G. Such notice shall be given within 24 hours of the occurrence of the accident.

10. *Unused lifts.*—When a lift installed at any place ceases to be used as such, the owner shall either remove it or maintain it in a safe mechanical condition after disconnecting it entirely from the electric supply. All gates and doors shall be efficiently locked so as to prevent the entry of unauthorised persons to the lift well.

SCHEDULE.

1. *Liftway.*—Every liftway shall be efficiently protected by a substantial end-closure fitted with gates or doors so as to prevent, when the gates or doors are shut, any person falling down the liftway or coming into contact with any moving part of the hoist or lift.

2. *Liftway gates and doors.*—All gates and doors of a liftway shall be so interlocked as to ensure that the gates and doors at any landing cannot be opened except when the lift cage is at such landing, and that the lift cage cannot be moved away from such landing until all the gates and doors at such landing are closed.

3. *Lift to be constructed so as to prevent persons in it from being trapped.*—Every lift and its enclosure shall be so constructed as to prevent any part of any person carried in the hoist or lift being trapped between the counterbalance weight and any other moving part of the hoist or lift.

4. *Load to be marked in the lift cage.*—There shall be marked conspiciously in every lift cage the maximum number of passengers (excluding the lift operator) which it can safely carry. No passengers exceeding this number shall be carried in the lift cage.

5. *Automatic devices for cutting off power to be provided.*—Efficient automatic devices in each lift shall be provided and maintained in each lift whereby all power shall be cut off from the motor before the car or balance weight lands on the buffers.

6. *Lift wells.*—(*a*) All lift wells intended for the reception of lifts shall be exclusively reserved for that purpose and shall not be used for any other purpose.

(*b*) The internal surface of lift wells, so far as is practicable, shall be kept flush. Any projections extending inwards from the general surface of the enclosure, at or near openings or landings, shall be bevelled by means of hard wood or metal plates to an angle of not less than 60 degrees from the horizontal, or by means of cement rendering or other fire-resisting materials.

(*c*) Lift wells, together with the whole of the contained equipment and apparatus, shall be rendered fire-resisting to the greatest possible extent.

7. *Lift way enclosures.*—(*a*) Where fire-resisting construction cannot be provided, the lift way *enclosure* shall be carried to a height of not less than seven feet, or such greater height as may be recommended by the Inspector of Lifts.

(*b*) All landing gates shall be of a close picket type and no opening exceeding 2½ inches in width shall be permitted between pickets or verticals when the gate is fully extended or closed up to a height of at least one foot from the landing level.

(*c*) Where wire grille or similar construction is used, the mesh or opening shall be not greater than 1½ inches and the lift way *enclosure* shall be of sufficient strength to resist accidental impacts from users of the staircase or adjoining floors.

(*d*) Where the clearance between the lift way *enclosure*, if of an open type, and any moving or moveable part of the lift equipment or apparatus is less than two inches, the openings in the enclosure shall be further protected by nettings of square mesh not greater than one-half inch and of wire not smaller than 20 S. W. G.

(*e*) The landing doors, in all cases where lifts are installed in wells having solid walls, shall be fitted with fire-resisting wired glass vision panels of limited area.

(*f*) No automatic fire door or shutter which operates by means of a fusible link or otherwise, due to the action of heat, shall be allowed in any landing, opening or the lift way *enclosure* of any lift, if such opening gives access to any exit from the building.

(*g*) No counterweight shall be allowed to travel in any lift well or part of any lift well other than to which it belongs.

(*h*) In the case of a lift well which is common to more than one lift and where counterweights are in juxtaposition to *cars* other than those to which they are attached, or to the counterweights of such other *lift cars*, such counterweights shall be guarded carefully and adequately, in such a manner as will obviate the risk of accidents to persons working in the lift well.

8. *Lift pits.*—(*a*) Between the lower limit of the travel of the lift cage and the bottom of the lift way and between the upper limit of the travel of the lift cage and the top of the lift way a space of not less than three feet shall be provided.

(*b*) Pits shall be soundly constructed and maintained in a dry and clean condition. Where necessary provision shall be made for permanent drainage.

9. *Suspension ropes.*—(*a*) Chain shall not be used for the suspension of a lift. Not less than three independent suspension ropes shall be used for *car* or counterweight of any lift with traction drive, and not less than two independent ropes with drum drive.

(*b*) All ropes anchored to a winding drum shall have not less than one complete turn of the ropes on the winding drum when the car or counterweight has reached the extreme limit of its travel and clearance.

(*c*) The factor of safety of the combined suspension ropes shall be not less than 12 based on a static contract load, plus the weight of the *car* and accessories.

(*d*) No car or counterweight rope shall be repaired or lengthened by splicing.

(*e*) The winding drum end of *car* and counterweight ropes shall be secured by clamps on the inside of the drum.

(*f*) The car and counterweight ends of the suspension ropes shall be fastened by spliced return loops, clipped return loops or individual tapered babitted sockets. Loops shall not bear directly on their fixings, but shall be lined with proper thimbless eyes or equal protection. In all cases the fastenings shall be capable of sustaining a load of not less than 80 per cent. of the ultimate strength of the undisturbed rope.

(*g*) Means shall be provided to equalise the load on the individual suspension ropes.

(*h*) The materials, quality, construction, and fixing of ropes shall, so far as is applicable, conform to the appropriate British Standard Specification.

(*i*) Tensioning devices for compensation ropes, governor ropes and the like, shall be protected against damage due to falling objects.

10. *Guides.*—(*a*) Car and counterweight guides shall be of steel in all cases except where the nature of the processes carried on in the building renders these unsuitable due to acid fumes or similar causes.

(*b*) For all speeds in excess of 200 feet per minute, TEE Section Guides only shall be used.

(*c*) Guides shall be continuous throughout the entire length of the lift well, and shall be provided with adequate iron or steel brackets or equivalent fixings of such design and spacing that the guides shall not deflect more than $\frac{1}{2}$th inch under normal operation.

(*d*) Guides shall be arranged to withstand the action of the safety gear when stopping a counterweight or fully loaded *car*.

11. *Lift Cages.*—(*a*) Lift cages shall be enclosed on all sides by means of the cage body, gates or doors, and such enclosure shall be at least 6 feet 6 inches in height. A roof, solid or perforated, capable of supporting the weight of a man weighing 150 lbs. shall be provided. Perforation shall be sufficiently close in mesh or casing to provide reasonable protection against falling articles to any person travelling in the cage. The cage floor shall be of a smooth non-slip surface.

(*b*) The cage of every automatically operated lift, in which a passenger or an attendant is at any time carried, shall be provided with an emergency stopping, device operated by a push button, which shall be clerly marked, and also an alarm signal operated by push button shall be provided inide the cage and shall be clearly marked. The alarm shall be clearly audible outside the *lift way*, in order to obtain assistance in case of a break-down or failure between the floors.

(*c*) Every lift installation controlled by an operator shall be operated by a removable handle or key which shall remain at all times in the possession of the operator. The handle or key shall automatically return to the off position when pressure is removed. Landing gates of such lift installations shall be opened only by a removable key which shall remain in the possession of the operator.

(*d*) Each lift cage shall be fitted with a light, and such light shall be left burning during the whole time the lift is available for use.

(*e*) Lift cages shall be fitted with an emergency exist, where practicable, which shall be fitted into the top of the cage in cases where one lift only operates in the well.

(*f*) Top exists shall open outward and shall clear all gear or equipment mounted on the top of the cage.

(*g*) A cage door or gate shall be placed at each entrance of lift cages. Such doors or gates shall, when closed, guard the full opening, and each door or gate shall be equipped with an electric contact which shall prevent the movement of the car, unless the door or gate is properly closed.

(*h*) Where *cage levelling devices* are used, aprons shall be fitted to the cage floor to ensure that no space is permitted between the threshold and the landing whilst the cage is being levelled to a floor.

*Note.*—See exemptions under paragraph xii of "Locking Devices for landing Gates and Doors".

12. *Inspection and maintenance of lifts.*—Every owner of a lift shall enter into a contract with the makers of the lift or their agents, for the satisfactory maintenance, including cleaning, oiling, adjusting and repairing of the lift. This clause shall not apply where in the opinion of the Electric Inspector the owner of the lift has suitable means for the satisfactory maintenance of the lift, including cleaning, oiling, adjusting and repairing of the lift.

13. *Locking devices for landing gates, doors and shutters.*—(*a*) Every landing gate, door or shutter shall be fitted with a locking device which shall comply with the appropriate requirements given hereafter;

(*b*) The systems of landing gate, door or shutter interlocks, shall be of the following three kinds, viz. :—

(*i*) The system in which the landing gate, door or shutter is locked by means of a device comprising a lock box, which is fitted to the frame of the gate, or shutter. Such devices are commonly known as electrical and mechanical interlocks.

(*ii*) The system in which the lift is operated only from the car and provided with solid sliding landing door which are equipped with a door closer and are locked with a mechanical contrivance actuated by means of levers operated from the car side only.

*Note.*—The door shall be considered closed and the car may be moved away from the landings when the door is within 4 inches of the jamb, or in the case of centre opening doors, when these are within 4 inches of each other, provided an approved attachment is fitted which will effectively prevent the doors from being re-opened after they have reached a limit of 4 inches, and provided also that the door closer is of such a type as will eventually carry the door or doors to, and, lock it or them in, the closed position.

(*iii*) The system in which the type of control does not require the presence of an attendant in the car and in which the landing doors are of the solid, sliding type equipped with a door closer and locked with a mechanical contrivance actuated by means of levers.

(*c*) All locking systems shall comply with the following requirements :—

(*i*) It shall not be possible to open the landing gate, door or shutter from the landing side until the lift cage is within that particular landing zone. (Provision may be made for the opening of the gate, door or shutter in case of emergency by means of a special key).

(*ii*) The car cannot be started or kept in motion between landing zones unless all the landing gates, doors or shutters are closed.

*Explanation.*—The landing zone shall mean the space between positions not more than 15 inches above or below the landing level.

(*iii*) The electrical and mechanical parts of all looking devices shall be of substantial design and construction. The removal of any inspection cover or covers shall not affect the operation of a device. All locking devices shall be fixed securely to the enclosure by suitable means.

(*iv*) The locking devices for landing gates, doors or shutters shall be so designed that the lock contact is not closed until the gate, door or shutter is closed.

(*v*) Any spring used in the locking device shall be in compression and properly supported.

(*vi*) Contacts shall be of solid type, pivoted or hinged and of sturdy construction.

(*vii*) The insulation resistance of the electrical equipment of the locking device shall be capable of withstanding for one minute a pressure of 2,000 volts, alternating current.

(*viii*) The design shall be such that reasonable wear between working parts does not permit of interference with the operation of the lift by movement of the lock handles.

(*ix*) The conduit carrying the conductors to the lock or contact boxes shall be fixed securely to the boxes and shall maintain electrical and mechanical continuity.

(*x*) The levers operating the mechanical part of the locking device shall be protected from the interference from the landing side of the lift way enclosure.

(*xi*) Provision shall be made on lifts operated from the cage and landings to prevent the opening of any landing gate, door, or shutter when the car is passing that zone in response to a call from another landing.

(*xii*) The locking device shall not prevent operation of the lift whilst the emergency release push is in temporary use, or when the car is being moved under the control of the levelling device.

(*xiii*) Lift cages having one or more entrances, any of which opens into a space in any portion of the travel which is in excess of 5 inches, shall have the gate or door to that side of the car protected by mechanical locking device with the electrical interlock.

14. *Motor rooms and overhead structures.*—(*a*) The lift machine, controller and all other apparatus and equipment of a lift installation, excepting such apparatus and equipment as functions in the lift well or other position, shall be placed in the motor room.

(*b*) The motor generators controlling the speed of multi-voltage or variable voltage machines, secondary sheaves, pulleys, governors, floor selecting equipment and the like, may be placed in a place other than the motor room, but such position shall be adequately lighted, ventilated and rendered fireproof and weatherproof.

(*c*) The motor room floor shall be designed and constructed to carry safely at any point the heaviest portion or unit of equipment, both during erection and for maintenance purposes.

(*d*) The motor room shall be so designed as to allow of reasonable access to all parts of the equipment, and provision shall be made to allow the removal and replacement of the various units.

(*e*) The height of the motor room shall be sufficient to allow any portion of the equipment to be accessible and removeable for repairs and replacement and in no case shall be less than 6 feet 6 inches clear.

(*f*) The motor room shall be soundly constructed and shall be weatherproof. They shall be ventilated effectively to prevent undue rise in temperature in the room. Every motor room shall be provided with an approved form of artificial lighting, and wherever available, electric lighting shall be provided in the form of one fixed fitting and one plug socket to each two or less machines.

(*g*) The motor room shall be provided with easy and safe access and doors shall be of sufficient opening to allow for the removal and replacement of parts of the

machinery therein. Where the floor level of a motor room is above or below that of the roof or adjacent floor a permanent stair or ladder shall be provided.

(*h*) The motor room shall be kept closed, except to those who are concerned with the operation and maintenance of the machinery or equipment. When the electrical pressure used is above 250 volts D. C. or 125 volts A. C., a danger notice shall be displayed permanently on the outside of the door and on or near the machinery.

(*i*) The motor room shall not be used as a store room or for any purpose other than for housing the machinery connected with the lift installation.

(*j*) The motor room shall be provided with an insulated portable hand lamp with workshop flexible for examining the machinery.

15. *Overhead pulleys.*—The place in which overhead pulleys are fixed shall be easily accessible for maintenance and repair purposes, shall be lighted adequately and shall be provided with a floor spacious enough to enable maintenance and repairs to be carried out in safety. In cases where the floor does not extend to the full area of the lift well, a guard rail or its equivalent shall be provided.

16. *Emergency Safety Devices.*—(*a*) Every lift suspended by wire ropes shall be provided with a *car safety gear*, attached to the lift cage frame and perferably placed beneath the car. The safety gear shall be capable of stopping and sustaining the lift cage with full contract load in the car.

(*b*) Every lift having a travel exceeding 18 feet shall be equipped with an overspeed governor device which will operate to apply the safety gear in the event of the speed of the lift cage in the descending direction exceeding a predetermined limit.

(*c*) The application of the safety gear shall not cause the lift cage platform to become out of level in excess of $\frac{1}{4}$ inch per foot measured in any direction.

(*d*) When the safety gear is applied, no decrease in the tension of the governor rope or motion of the car in the descending direction shall release the safety gear.

(*e*) When a safety gear comes into operation, it should automatically open circuit the operating circuit, but it should be possible for a *responsible person* to release the safety gear after a thorough inspection of the equipment and the taking of any necessary precautions, by reversing the direction of the motion of the machine.

(*f*) The safety gear shall operate to stop and sustain the lift cage in the event of failure of the suspension ropes, or in the event of the lift exceeding a predetermined maximum speed in the descending direction when a speed governor is fitted.

(*g*) Every safety gear shall operate positively and mechanically, independently of any springs used in its construction.

(*h*) Any levers or dogs operated by shafts shall be keyed to such shafts by B. S. S. No. 46 keys.

(*i*) The design of the safety gear shall provide for its application to both guides and to each side of such guides equally.

(*j*) Any additional rope used solely for the purose of operating the safety gear shall be led over independent pulleys, running on independent shafts.

(*k*) All bearings for drums and screw shafts in connection with the safety gears shall be of non-ferrous metals.

(*l*) The lift cage speed governor shall be set to cause the application of the safety gear at a speed not more than 40 per cent., and not less than 15 per cent., above the contract speed, provided that no governor shall be required to trip at a speed less than 175 feet per minute and with the instantaneous type of safety gear shall trip at a speed not exceeding 250 feet per minute.

(*m*) The *counterweight safety gear*, if any, may be operated by the same governor and governor rope used to operate the lift cage safety gear, provided it complies with the requirements for, and for the application of, counterweight safety gears. Provision shall be made to cause the application of the counterweight safety gear at a speed greater than the lift cage safety gear, but at not more than 10 per cent. in excess of that at which the lift cage safety gear applies.

(*n*) Broken rope safety gears of the insta ntaneous type may be used on counterweights within the following limits :—

| Contract speed (Ft. per minute). | Total weight of counterweight in pounds. |
|---|---|
| 250 .. .. .. .. .. | 2,000 |
| 200 .. .. .. .. .. | 3,000 |
| 150 .. .. .. .. .. | 4,000 |
| 125 .. .. .. .. .. | 5,000 |

(*o*) The types of safety gear shall be of the following three kinds, namely :—

(*i*) Instantaneous type, limited to speeds not exceeding 200 feet per minute (Type I).

(*ii*) Gradual Wedge Clamp type, with gradual increasing retarding force. (Type G. W. C.).

(*iii*) Flexible Guide Clamp type, with constant retarding force. (Type F. G. C.).

(*p*) No safety gear shall be permitted to stop an ascending lift cage or *counterweight*. If an ascending car is to be stopped on account of overspeed, a safety gear shall be fitted to the counterweight for this purpose. The governor may, however, open the motor circuit and apply the brake in the event of overspeed in the ascending direction.

(*q*) The governor shall be placed where it cannot be struck by the lift cage in case of over-travel and where there is sufficient space for the full movement of the governor parts.

(*r*) The motor control circuit and the brake control circuit shall be opened before or at the same time as the governor trips.

(*s*) Governor ropes shall run clear of the governor jaws during the normal operation of the lift.

(*t*) The proper tripping speed of the governor shall be stamped on the governor base or on a brass plate attached to the base.

(*u*) When replacing governor ropes, they shall be of the same size, material and capacity as the ropes supplied originally and installed by the makers of the lift, except that where a rope of different characteristics is proposed, a test of the car and/or counterweight safety gear shall be made, to determine the fitness of the new ropes.

(*v*) The arc of contact between the governor jaws shall be such that no cutting, tearing or deformation of the rope shall result from the operation of the safety gear.

(*w*) It is recommended that governor gears have self-lubricating bearings which do not require frequent attention.

(*x*) In case of a safety gear actuated by means of a rope unwinding from a drum, such drum shall have at least three complete turns on the drum after the safety gear has been applied and the car stopped. The minimum diameter of such drum shall be 5 inches (five inches). The device for holding the safety rope or rod in position during normal operation shall be fixed to the steel-frame work of the car and not to the car bodywork. The ends of the governor rope shall be held by a clevis or other similar means, which shall effect its purpose by friction. The clevis or other holding device shall be supported by or from the steel framework of the car and not fixed to the car bodywork.

(*y*) No safety gear shall depend on the completion or maintenance of an electric circuit for its operation. All safety gears shall be applied mechanically.

(*z*) The gripping surfaces of car or counterweight safety gears shall not be used to guide the lift cage or counterweight but shall run free of the guides during normal operation of the lift.

*Note.*—A pawl or ratchet shall not be held to constitute a sufficient safety for lifts travelling in a vertical or substantially vertical direction.

17. *Safety Gear Tests.*—(*a*) A contract load test shall be made by the Inspector of Lifts of each new lift, before such lift is put into service for normal and regular operation. This test shall be made to determine whether the safety gear will operate satisfactorily within the specified limits.

(*b*) The test shall be carried out in the presence of the Engineer who is entrusted with the work of installing the lift.

(*c*) The maximum stopping distances of cars with safety gears of types G. W. C. and F. G. C. with the contract load in the lift cage, and the minimum stopping distances with the attendant only in the lift cage shall be as follows :—

| Speed | Maximum distances with contract load. | | Minimum distances with attendant only in the lift cage. | |
|---|---|---|---|---|
| | Type G. W. C. | Type F. G. C. | Type G. W. C. | Type F. G. C. |
| | Ft. in. | Ft. in. | Ft. in. | Ft. in. |
| 300 ft/m. ... ... | 7 0 | 1 9 | 1 6 | 0 6 |
| 400 ft/m. ... ... | 7 9 | 2 6 | 1 8 | 0 9 |
| 500 ft/m. ... ... | 8 9 | 3 6 | 1 10 | 1 0 |
| 600 ft/m. ... ... | 10 0 | 4 9 | 2 1 | 1 3 |
| 700 ft/m. ... ... | 11 3 | 6 6 | 2 4 | 1 6 |
| 800 ft/m. ... ... | 12 3 | 8 3 | 2 8 | 9 |

(*d*) Stopping distance shall mean the actual slide as measured by the marks of the guides.

(*e*) The runaway test shall be made with all electrical apparatus intact, except for the overspeed contact or cut-out on the governor. For lifts operating direct y from alternating current the governor shall be tripped by hand at the maximum speed obtainable.

(*f*) At each examination the safety gear shall be tested with the lift cage stationery and the lift cage shall be lowered to ensure that the safety gear functions correctly.

18. *Slack Cable Switch.*—All lifts, having winding drum machines, shall be equipped with an effective slack cable switch which will cut off the power and stop the machine if the lift cage is obstructed in its travel in the descending direction. Slack cable switches shall be constructed so as to be self-setting or self-resetting when the slack in the cable has been taken up.

19. *Counterweights.*—(*a*) All *counterweights* shall run in rigid steel guides. If an independent car counterweight be used, it shall not be of such a weight as will cause undue slackening of any of the suspension ropes during acceleration or retardation.

(*b*) *Counterweight sections*, whether or not carried in frames shall be secured by at least two tie rods passing through holes in all the sections. Such tie rods shall have lock nuts at each end, further secured by split pins, and the factor of safety of the threaded portion of the bolts shall be not less than 10.

20. *Lift Machines.*—(*a*) No friction gearing and clutch mechanism shall be used for connecting the main gear to the hoisting drum or sheaves.

(*b*) No belt or chain driven machine shall be used to raise the lift cage. No worm gear having cast iron teeth shall be employed.

(*c*) Winding drum and traction machines for power driven lifts shall be equipped with the brakes applied automatically by means of springs in compression only or by gravity, when the operating device is in the "of" position or in the event of the power being cut off from any cause.

(*d*) Electric lift machines shall be provided with brakes released electrically.

(*e*) No single earth fault, short circuit or counter-E.M.F. shall prevent the brake from being applied during normal operation.

21. *Sheaves and Drums.*—(*a*) All sheaves and leading pulleys shall be of disc construction, i.e. without spokes, and properly stiffened.

(*b*) All driving sheaves fixed to and revolving with a shaft shall be fixed by means of standard sunk keys, to comply with B.S.S. No. 46, current edition.

(*c*) Traction sheaves, drums and worm-wheels shall be fixed with at least two keys as above, except when the design renders the use of keys unnecessary.

(*d*) All sheaves and pulleys shall be fitted with flanges or shrouds and finished grooves. "U" grooves shall be to the terms of B.S.S. No. 329, current edition.

(*e*) The motor of each lift machine or the worm shaft shall be arranged so as to provide hand-winding facilities and shall be suitably marked for the direction of up and down travel of the lift cage.

22. *Shafts.*—(*a*) Any shaft carrying a sheave or pulley and fitted between dead eyes or other housing shall be stepped, i.e., reduced in diameter at or near the point of entry at each end.

(*b*) Any shaft where stepped, shall be turned to a reasonable radius at the point of reduction in diameter.

23. *Operation and Control.*—(*a*) A manually operated main disconnection switch shall be installed in the main circuit cables of electric lift machines or motor generator sets. This switch shall be placed close to and visible from the machine or motor generator set it controls.

(*b*) When metal to metal contacts are used on the controller switches for opening the main circuits, or for stopping a lift machine, at least two independent current breaks shall be incorporated in the design.

(*c*) In the case of an automatic (push button operated) lift, no operation of a spring or springs in tension nor the completion of another electric circuit shall be depended upon to break the circuit to stop the lift at terminal landings.

(*d*) The interruption of the electrical circuit shall stop and/or shall prevent the movement of the car.

(*e*) Each lift machine operated by a polyphase A. C. motor shall be protected against phase reversal or failure. This shall not apply to an A. C. motor forming part of a motor generator.

(*f*) No control system shall be used which depends on the completion or maintenance of an electrical circuit for the interruption of the power supply and the application of the electro-mechanical brakes when the lift cage reaches the terminal floors; neither for the operation of the safety gears, nor for the closing of a contractor by an emergency "stop" button, except that this regulation shall not apply to dynamic breaking nor to speed control devices.

(*g*) Automatic (push button operated) lifts shall conform to the following requirements :—

(*i*) It shall not be possible to start the lift cage under normal operation unless every landing door and/or gate is in the closed position.

(*ii*) The landing push buttons shall be inoperative during the whole time an occupied lift cage is in use. The landing push buttons shall remain inoperative until the person or persons using the lift have vacated the lift cage and the landing gate or door has been again closed, except that in cases where a pre-selector circuit is used, the push bottons may be utilised for this purpose provided they do not in any way interfere with the direction of the current journey and that a time lag is provided to regulate the restarting of the lift cage.

(*iii*) If moveable lift cage floor construction is used the lift cage may be moved with its gate open, when it is not occupied, but it shall be inoperative from the lift cage push buttons when the moveable floor is not depressed. The entire floor within the car enclosure shall be moveable and shall operate when a weight of 30 lbs. is placed upon it at any point.

(*iv*) No hand-rail or seat shall be fitted in the lift cage with moveable floor construction.

24. *Capacity and Loading.*—(*a*) The contract load test shall be made by the Inspector of Lifts of every new power lift installation, before it is put into general use. Such contract load test shall be made with full load in the lift cage and in the presence of the Engineer who is entrusted with the work of erecting the lift.

(*b*) The brakes, limit switches, buffers, safety gear or gears and speed governor, if fitted, shall be made to function during each test, and the electrical wiring and connections shall be tested for earthing, insulation resistance and general soundness.

(*c*) A plate shall be affixed to each lift cage in a conspicuous position and shall bear at least the following particulars :—

The maximum capacity of the lift in terms of passengers, calculated at 150 lbs. per passenger.

25. *Buffers.*—(*a*) Buffers of the spring, oil or equivalent type shall be fitted below the lift cage of every lift.

(*b*) Spring buffers or their equivalent may be used with lifts having a contract speed not exceeding 300 feet per minute.

(*c*) Oil buffers or their equivalent shall be used with lifts having a contract speed in excess of 300 feet per minute.

(*d*) The maximum retardation of oil buffers, based on governor tripping speed, shall not be in excess of 80·5 feet per second, i.e., 2·5 times gravity retardation.

(*e*) The minimum total stroke of oil buffers shall be based on an average retardation of 32·2 feet per second, based on governor tripping speed.

(*f*) Oil buffers shall be provided with a means of determining easily the amount of oil in them.

(*g*) Buffers shall be placed symmetrically with respect to the centre of gravity of the lift cage, and shall be so arranged that the lift cage, in ordinary circumstances of operations, cannot strike them.

(*h*) Counterweights shall be fitted with buffers, similar to those specified for lift cages and arranged symmetrically below the weight.

26. (*a*) All wiring in connection with the lift installation shall be installed in accordance with the rules and regulations of the Indian Electricity Act, 1910, and the Bombay Fire Insurance Association, respectively and metallic covering shall be used to protect all cables wherever possible.

(*b*) All metallic covering to wiring shall be properly earthed and continuity shall be maintained throughout.

(*c*) All control circuits shall be fused, or otherwise protected against faults or overloads, independently of the main circuits.

(*d*) All controlling cables shall be of flexible construction and shall comply with the specification laid down in the regulations of the Bombay Fire Insurance Association.

27. *Terminal Limit Switches.*—(*a*) Every electric lift shall be provided with upper and lower terminal limit switches arranged to stop the car automatically within the top and bottom overtravels from any speed attained in normal operation. Such limit switches are to act independently of the operating device, the ultimate or final limit switches and the buffers. (In the case of handrope or rod operating devices the terminal stopping device may operate in conjunction with the operating device).

(*b*) Terminal stopping limit switches may be fitted to the lift cage in the lift well or in the motor room, and such switches shall be brought into operation by the movement of the lift cage.

(*c*) Electric lifts having handrope or rod operating device shall have stops fastened securely to the rod or rope, arranged to centre the operating device for stopping the lift cage.

(*d*) Electric lifts having winding drum machines with handrope or rod, lever or wheel operating devices, shall have a device to centre the operating device automatically.

28. *Ultimate or Final Limit Switches.*—(*a*) Electric lifts shall, in all cases, be provided with ultimate or final limit switches arranged to stop the car automatically within the top and bottom clearances independently of the normal operating device and the terminal limit switches, but with the buffers operative. The switches and the oil buffer shall be so arranged that the opening of the switch and the engagement of the buffer shall be as nearly simultaneous as is possible. When spring buffers are employed, the switch shall open before the buffers are engaged.

(*b*) Ultimate or final limit switches shall act to prevent movement of the lift cage under power in both directions of travel and shall, after operating, remain open until the lift cage has been moved by hand winding to a position within the limits of normal travel.

(*c*) Ultimate or final limit switches shall not be mounted on the lift cage and shall be operated by the movement of the lift cage in the lift well. Electric lifts having winding drum machines shall have in addition, stopping limit switches operated by the machine.

(*d*) Ultimate or final limit switches shall not control the same switches on the controller as the terminal limit switches unless two or more separate and independent switches are provided, two of which shall be closed to complete the motor and brake circuit in each direction of travel. When the ultimate or final limit switches control the same switch or switches on the controller as the operating device or the terminal limit switches, they shall be connected in the control circuit on the opposite side of the line.

(*e*) Ultimate limit switches designed to open the main circuit of the motor may control the same switch or switches on the controller as the terminal limit switches, but when such ultimate limit switches are employed on direct current power supplies they shall be provided with additional contacts to control the brake circuits.

FORM A.

(*See* section 4 and rule 3.)

*Application for permission to erect lifts.*

(To be submitted to the Inspector of Lifts, Bombay.)

(To be filled in in English.)

Full name and address of the applicant ..

Name and address of Agent, if any. ..

Wheher a license has been previously gratnted. (Details to be given.)

Type of lift proposed to be erected. (A sketch of the lift and erection plans should be attached.)

The rated maximum speed of the lift ..

The makers' or designer's rated capacity in weight.

The maximum number of passengers in addition to the lift operator which the lift can carry.

The total weight of the lift cage carrying the maximum load.

The weight of the counterweight ..

The number, description, weight and size of the supporting cables.

The depth of the pit from lowest part of the lift cage when at the lowest floor.

Details of the construction of the overhead arrangement with the weight and sizes of the beams.

Date (Signature of the applicant.)

FORM B.

[*See* section 5 and rule 4 (1).]

*Notice intimating the completion of the work of erection of a lift and application for a licence to work the lift.*

To

The Inspector of Lifts, Bombay.

*Subject.*—Erection of lift at the (premises).

Sir,

With reference to letter No. dated from the Electrical Engineer to Government, Bombay, by which permission has been granted to erect a lift at the abovementioned premises, I/we have to state that the work of erection of the lift was completed on . We further request that a license for working the lift may be granted. The work of erection of the lift has been carried out in accordance with the Bombay Lifts Rules, 1940.

A fee of Rs. 20 has been paid into the Reserve Bank of India, / Government Treasury at and a chalan for that amount is enclosed.

Yours faithfully,

.....,

(Signature of the owner or owners of the premises.)

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FORM C.

(*See* sections 5 and 6 and rules 4 and 5.)

GOVERNMENT OF BOMBAY.

*License for Working Lifts.*

Mr. / Messrs. is/are

HEREBY AUTHORISED TO WORK THE LIFT INSTALLED IN THE PREMISES owned by and situated subject to the conditions mentioned in the Bombay Lifts Rules, 1940.

Electrical Engineer to Government,
Bombay.

Dated at

The day of 19 .

FORM D.

(*See* Rule 5.)

*Application for permission for working a lift installed prior to the 1st June 1940.*

(To be submitted to the Inspector of Lifts, Bombay.)

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(To be filled in in English.)

Full name and address of the applicant ..

Name and address of Agent, if any ..

Type of lift erected. (A sketch of the lift should be attached.)

The rated maximum speed of the lift ..

The maker's or designer's rated capacity in weight.

The maximum number of passengers in addition to the lift operator which the lift can carry.

The total weight of the lift cage carrying the maximum load.

The weight of the counterweight ..

The number, description, weight and size of the supporting cables.

The depth of the pit from the lowest part of the lift cage when at the lowest floor.

Details of the construction of the overhead arrangement with the weight and sizes of the beams.

Full details as to in what respects the lift does not comply with the requirements laid down in the schedule to the Bombay Lifts Rules, 1940.

A fee of Rs. 20 has been paid into the Reserve Bank of India, Bombay / Goverment Treasury at and a chalan for that amount is attached.

(Signature of the applicant.

Date

FORM E.

(*See* Rule 8.)

*Notice.*

Under sub-section (*1*) of section 8 of the Bombay Lifts Act, 1939, I hereby give notice that on

at $\frac{\text{A.M.}}{\text{P.M.}}$ I will visit the building in which the

lift $\frac{\text{is installed}}{\text{is being installed}}$ in connection with which an application for a license has been received,

for the purpose of inspecting $\frac{\text{the lift}}{\text{the lift installation}}$ $\frac{}{\text{the site for the lift.}}$

(Signature)
Inspector of Lifts.

Dated at

The day of 19 .

Mr./Messrs.

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FORM F.

(*See* Rule 8.)

*Form of Order under section 8 (2) of the Bombay Lifts Act, 1939.*

No. of 19 .

Dated 19 .

To

..... (Name of licensee.)

.....

1. Whereas it appears to me that the lift installed at the premises owned by you is in an unsafe condition, I hereby call upon you under sub-section (*2*) of section 8 of the Bombay Lifts Act, 1939, to carry out such repairs and/or alterations to the said lift as are stated in the accompanying sheet on or before the day of 19 and to report compliance in writing to me.

2. I hereby also order that you shall discontinue the use of the lift and shall not resume the working thereof until the repairs and/or alterations referred to in paragraph 1 above have been carried out and the unsafe condition of the lift is removed and until a written permission to resume the working of the lift is granted by me.

(Signature) .....,

Inspector of Lifts.

Dated at
The day of 19 .

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FORM G.

(*See* Rule 9.)

*Notice of Accidents to Lifts.*

To

The Inspector of Lifts, State of Bombay.

Under sub-section (*1*) of section 9 of the Bombay Lifts Act, 1939, I/we hereby inform you that an accident has occurred in the operation of lift at the premises owned by me/us on the details of which are given below :—

I/We have discontinued the working of the lift, pending permission to resume the working.

Yours faithfully,

Dated at
The day of 19 .

To

The Inspector of Lifts, Bombay.
The Commissioner of Police, Bombay.
The District Magistrate, .....